

ESTABLISHING THE OFFICE OF TECHNOLOGY ASSESSMENT AND AMENDING THE NATIONAL SCIENCE FOUNDATION ACT OF 1950

AUGUST 16, 1971.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. DAVIS of Georgia, from the Committee on Science and Astronautics, submitted the following

REPORT

[To accompany H.R. 10243]

The Committee on Science and Astronautics, to whom was referred the bill (H.R. 10243) to establish an Office of Technology Assessment for the Congress as an aid in the identification and consideration of existing and probable impacts of technological application; to amend the National Science Foundation Act of 1950, and for other purposes, having considered the same, report favorably thereon without amendment and recommend that the bill do pass.

PURPOSE OF THE BILL

The purpose of the bill is to establish an Office of Technology Assessment for the Congress as an aid in the identification and consideration of existing and probable impacts of technological application, and to amend the National Science Foundation Act of 1950, as amended, to conform therewith.

EXPLANATION OF THE BILL

Founding of the OTA

The bill extends the congressional information-gathering function with an Office of Technology Assessment (OTA) in the legislative branch.

The Office would be composed of a policymaking body called the Technology Assessment Board and an operational unit to be headed by a Director. The Board's functions would be limited to the formulation

and promulgation of policy; the Director would be responsible for the day-to-day operations of the Office.

Responsibilities of the OTA

The basic responsibilities and duties of the Office would be to provide an early appraisal of the probable impacts, positive and negative, of the applications of technology and to develop other coordinate information which may assist the Congress in determining the relative priorities of programs before it.

In carrying out these functions the Office would: (1) identify existing or probable impacts of technology or technological programs; (2) where possible establish cause-and-effect relationships; (3) determine alternative technological methods of implementing specific programs; (4) determine alternative programs for achieving requisite goals; (5) make estimates and comparisons of the impacts of alternative methods and programs; (6) present findings of completed analyses to the appropriate legislative authorities; (7) identify areas where additional research or data collection is required to provide adequate support for the assessments and estimates described, and (8) undertake such additional associated tasks as the appropriate authorities may direct.

It is emphasized that these are *informational functions*—not functions of control or recommendation. They are designed to supplement existing systems of acquiring information, such as the hearing system.

Organization of the OTA

The Board would be composed of 11 members as follows:

Two Senators, one from each party, appointed by the President pro tempore of the Senate; two Members of the House, one from each party, appointed by the Speaker; the Comptroller General of the United States; the Director of the Congressional Research Service of the Library of Congress; four especially qualified members from the general public appointed by the President with Senate approval; and the Director of the Office.

The four Board members from the general public would be appointed for 4-year staggered terms. The terms of two members would expire every other year and two new members would be appointed. The members of the Board could be reappointed once, making a maximum service of 8 years.

The Chairman and Vice Chairman of the Board would be elected by the Board from among its general public members.

The Director of the Office would be appointed by the Board for a 6-year term. Once appointed, he would also become a member of the Board and would be a voting member in all matters except with regard to his reappointment. No limit is placed on his reappointment.

Authority of the OTA

The usual powers and authorities of a functioning agency of Government are provided for the Office of Technology Assessment, including those of promulgating rules and regulations, making contracts, hiring personnel, fixing compensation, etc. The Office would also be authorized to sit and act wherever and whenever necessary. It would have powers of subpoena, subject to safeguards where proprietary information or invasion of privacy might be involved.

The Office would itself be prohibited from operating laboratories, pilot plants, or test facilities in the pursuit of its mission.

Special Arrangements

Special arrangement is made for cooperative activities and supportive services to the Office through the Library of Congress and the General Accounting Office. The former would be directed to provide informational, monitoring and staff assistance to the OTA on a continuing basis. In addition to investigative activities, the latter would provide administrative, financial, and housekeeping services. Arrangements for reimbursement for services could be made to both these units through action by the Board. Authority would be further granted to the Library of Congress to expand or augment its organization to the extent necessary to service the OTA.

Coordination with the National Science Foundation

The Office would be directed to maintain special coordination and cooperation with the National Science Foundation with respect to: (1) Grants and contracts formulated or activated by the Foundation which are for purposes of technology assessment, and (2) the promotion of coordination in areas of technology assessment and the avoidance of unnecessary duplication or overlapping of research activities in the development of technology assessment techniques and programs.

The Foundation's organic act would be amended to permit a closer working relationship in these matters since NSF is the principal executive agency engaged in the research and development of technology assessment methodology.

Instigation and Use of Assessments

Assessments could be initiated by the chairman of any committee of the Congress, for himself or on request of the ranking minority member or a majority of committee members; or by the Technology Assessment Board or the Director. All results would be freely available to the public except in cases involving national security or where public information statutes would prohibit it.

Authorization of Funds

The bill authorizes \$5 million for fiscal year 1972 for the establishment of the OTA.

RATIONALE

The reasons behind H.R. 10243 are compelling ones. Indeed, they are rooted in the deep-seated environmental, social, and economic problems which comprise the great bulk of the serious difficulties confronting the Nation today.

Each of these problems is in some way, and often to a high degree, intertwined with the manner in which Americans have chosen to apply the multitude of technologies available to them. At the same time, and more often than not, the solution to the problems is at least partly dependent upon the application of both improved and better managed technology.

Like most institutions today, the Congress has been and remains unable to visualize all the potential influences of technology. Not only are its own Members seldom trained to ascertain the optimum use of technology, but it has no mechanism independent of the Executive branch or special interest groups for helping it make such judgments. For these reasons, the committee believes that failure to provide the Congress with new ways to evaluate the effects of technology, pro and con, will prove shortsighted in the extreme, if not disastrous.

Perhaps the most succinct way of stating the case is to repeat the declaration of purpose in the bill:

Emergent national problems, physical, biological, and social, are of such a nature and are developing at such an unprecedented rate as to constitute a major threat to the security and general welfare of the United States.

Such problems are largely the result of and are allied to (1) the increasing pressures of population; (2) the rapid consumption of natural resources; and (3) the deterioration of the human environment, natural and social; though not necessarily limited to or by these factors.

The growth in scale and extent of technological application is a crucial element in such problems and either is or can be a pivotal influence with respect both to their cause and to their solution.

The present mechanisms of the Congress do not provide the legislative branch with adequate independent and timely information concerning the potential application or impact of such technology, particularly in those instances where the Federal Government may be called upon to consider support, management, or regulation of technological applications.

It is therefore imperative that the Congress equip itself with new and effective means for securing competent, unbiased information concerning the effects, physical, economic, social, and political, of the applications of technology, and that such information be utilized whenever appropriate as one element in the legislative assessment of matters pending before the Congress.

Foundation of H.R. 10243

The bill is the result of carefully considered study and work over a five year period. As the "Background" section of this report shows, it has been preceded by discussions with the committee's advisory panels, public seminars, three contract studies undertaken for the committee by highly competent organizations, two comprehensive sets of hearings, and many months of subcommittee and staff labor.

H.R. 10243 is the fifth in a series of bills directed at the need for a technology assessment capability. The first was introduced in 1967 for discussion purposes. The second was introduced early in 1970 as the basis for hearings on a specific proposal for a technology assessment mechanism. The third was a clean bill which followed the 1970 hearings and contained a number of changes based on those hearings (see "Committee Action—1970," pages 21–22). The fourth bill was identical to the third but was introduced in the new 92d Congress as H.R. 3269. The fifth and current bill, H.R. 10243, is H.R. 3269 as amended in committee. (See "Committee Action—1971," page 22.)

Evidence of the Need

Throughout this century, and particularly since World War II, the Congress has been forced to deal with issues caused or influenced by, or containing, a wide variety of technological factors. In fact, one can think of very few issues during this period which did not or do not have a pronounced technological component.

The supersonic transport, the Northeast Corridor experiment, weather modification and desalination of seawater, are ready examples in the field of commerce. Nuclear power development, stored-energy innovations, and the hydroelectric *versus* ecology issues of the Northwest are examples in the energy field. Pollution, food supplies, use of pesticides, development of the electric auto engine, and strip-mining techniques are examples in the field of environment. Space exploration, oceanography, Antarctic investigation, global atmospheric research are examples in areas of new inquiry and developing culture. Patterns of crime, the various protest movements, medicare, and the new health programs, computerized information and education, genetic control, even the minimum national income plan are examples in the fields of social and biological evolution. With respect to areas of national defense, examples are too numerous to mention; even in unclassified fields such as personnel, logistics, supply, training, and the like, technological factors are ever present.

Each is related to some facet of technology through some branch of the science family tree; and obviously most of the above named categories or fields are related to each other.

Increasingly, as issues such as these confront it, the Congress is called upon to provide new support, management, or control with regard to the applications of technology. Yet, the Congress has provided itself with no new institutionalized aid since the functions of the General Accounting Office were established in 1921; no totally new device for providing Congress with informational capabilities has been inaugurated since the Legislative Reference Service (now the Congressional Research Service) was created in 1915, over half a century ago.

We submit that this matter is so critical to the operation of today's legislature, so much a part of its operation, that the help of a highly skilled, problem-oriented, independent office is warranted—an office not immersed in or responsible to existing institutions and their modes of operation. At the same time we recognize the great value of utilizing the capabilities of existing institutions; hence the OTA would receive support from the General Accounting Office and the Library of Congress, as described in other sections of this report.

Both the Comptroller General and the Librarian of Congress have endorsed the bill in testimony before this committee.

Evidence of Growing Concern

A study of the Science, Research and Development Subcommittee made last year, "Technology Assessment—Annotated Bibliography and Inventory of Congressional Organization for Science and Technology"—shows 39 congressional committees or subcommittees, plus 4 joint committees or subcommittees, whose activities and needs are directly applicable to technology assessment. These activities include not only such areas as those cited above, but less obvious ones such as studies requested by the House Foreign Affairs Committee on international problems arising from new methods of exploiting the seabeds, and requests of the Congressional Commission on Government Procurement for assistance in evaluating the procurement of research and development itself.

The technology assessment concept has spread into the activities of the Executive branch, into the affairs of industry, and into the deliberations of international organizations. The Office of Science and

Technology, the Department of Transportation, the National Science Foundation, the National Aeronautics and Space Administration, the Department of Housing and Urban Development (through the Urban Institute), among other agencies, are presently experimenting with technology assessment techniques.

At least five Federal departments, under the Environmental Quality Act, have been going through exercises which are tantamount to technology assessment. Conforming with Section "102" of that Act, for example, the Interior Department is running assessments in conjunction with offshore oil leases in western Louisiana; the Department of Housing and Urban Development is doing the same in conjunction with a planned insured housing project; the Atomic Energy Commission has been involved in two such activities, one in connection with a proposed radioactive waste repository in Kansas and the second involving the licensing of new nuclear power facilities; the Army Corps of Engineers has been experimenting with assessments in conjunction with a flood protection project in Colorado; the Soil Conservation Service has made assessments in conjunction with certain watershed projects; a similar endeavor has been reported in the Transportation Department in connection with a new interstate highway.

Industries such as petroleum, aircraft, and agriculture are beginning to do the same, often in collaboration with university research. Arthur D. Little, Mitre Corp., and other businesses oriented toward systems analytic modes of problem solving are similarly involved.

In addition, nonprofit groups such as the Rand Corp., Stanford Research Institute, and Battelle Memorial Institute are reported doing work on technology assessment methodology and/or engaged in assessment pilot projects.

At the same time, much interest is apparent among international organizations. The United Nations, the Organization of Economic Cooperation and Development, and UNESCO are studying a variety of phases of the early warning system which technology assessment should help to provide. NATO's Science Council is considering undertaking pilot projects in this direction; it is ready to commit funds for the purpose as soon as a program of mutual interest is agreed upon. Prior to such action, however, NATO has now decided to devote one of its Advanced Study Institutes to Technology Assessment. This will be an extended conference, involving some 15 or 20 special lecturers who will conduct classes for the Institute in Milan, Italy, in the fall of 1972.

ADMINISTRATION VIEWS

In hearings held by the Subcommittee on Science, Research, and Development during November and December 1969, many of the most technologically involved officials of the executive branch appeared as witnesses. As the section of this report dealing with witness views will show, all of these expressed deep interest in the technology assessment concept and they were unanimous in their recommendation that it be further explored and developed.

When a bill was finally drafted dealing with technology assessment, however, it focused only on providing an assessment capability for the Congress. The committee viewed this matter as of first priority.

Because the bill dealt only with legislative organization, no effort

was made in the 1970 hearings to obtain the views of a wide range of executive witnesses. The Director of the National Science Foundation was heard, however, since the bill called for specific liaison with the Foundation and amends the NSF organic act. The testimony of the Director was favorable to the program called for by the bill but made no specific recommendations on its details.

Meanwhile, considerable activity within the executive branch has emerged which indicates strong interest in technology assessment. The President's Office of Science and Technology, for example, has funded pilot projects to help develop technology assessment techniques. The National Aeronautics and Space Administration and the Department of Transportation have contracted for the technological assessment of DOT's overall transportation programing. The Department of Commerce has been studying assessment aspects of its program on weather modification. The National Science Foundation has allotted a portion of its research funds for development of assessment techniques and is considering the possibility of setting up a division of technology assessment.

Meanwhile, more concrete evidence of the administration's views has evolved. This is apparent from two reports, one made by the President's Task Force on Science Policy, in April, and the other by the White House National Goals research staff, in July, both in 1970.

The first report, entitled "Science and Technology—Tools for Progress," devotes a major part of its discussion to achieving more effective assessment in technology.

Indeed, this report states that "Additional machinery for technology assessment is needed, and the base for developing such machinery now exists." One of the report's concrete recommendations is:

The Federal technology assessment structure should have components located strategically in both the executive and legislative branches to create a forum for responsible technological assessment activities not only in Government but also in the private sector.

The task force recommends, so far as the executive branch is concerned:

The Office of Science and Technology should be directed by Executive order to develop a Federal structure for technology assessment, in general accord with the recent National Academy of Sciences and National Academy of Engineering reports to the Congress.

Both reports mentioned were carried out under contract with the House Committee on Science and Astronautics and served as a partial basis for this legislation.

The report made by the White House National Goals staff, is "Toward Balanced Growth: Quantity with Quality". This report carries an entire chapter on technology assessment. It observes:

The most comprehensive effort to pin down the complexity and range of elements identified with technology assessment is in the House-proposed bill to establish an Office of Technology Assessment for the Congress. * * * Since it is highly likely that some formal structure for technology assessment will be established, the implications for developing a national

growth policy [must] be explored. * * * It would appear that the technology assessment movement not only as represented by congressional efforts but as expressed in the attitudes and behavior of the public at large—represents a turning point in our attitude toward technology about as profound as the change in our attitude toward the environment. * * * It is clear that in both the public and private sectors assessments of the impact of technological advances are increasing.

It must also be noted that the President's Council on Environmental Quality, in its first annual report submitted August 3, 1970, took a similar stand. It stated:

The environmental problems of the future will increasingly spring from the wonders of 20th century technology. In the future, technology assessment must be used to understand the direct and secondary impacts of technological innovation.

Again it should be noted that the first report of the House Committee on Merchant Marine and Fisheries on the administration of the National Environmental Policy Act, cited the President's charge to the Council stipulating "development and use of indices and monitoring and to foster investigations, studies, services, research, and analyses including technology assessment."

It is apparent that while the Administration has no announced position on H.R. 10243, it is keenly aware of the technology assessment concept and is sympathetic to the demonstrated need for sophisticated handling and application of that concept.

BACKGROUND OF LEGISLATION

90TH CONGRESS—H.R. 6698

The technology assessment concept stems from a variety of sources stretching back to 1964, including the following: The subcommittee's interest in environmental problems, its associations with members of the science community concerned about the need for more rapid technology transfer, its discussions with individuals who expressed serious concern over the science-society relationship, and its immediate dealings with the current and future role of the National Science Foundation.

Technology assessment's first enunciation and publication came in the subcommittee's second progress report in 1966. This report was the opening gun of committee activities dealing with technology assessment. It was partially due to the influence of this report that the technology assessment concept evolved into a legislative reality. Since publication of the 1966 report, the subcommittee has been aware of the need for Congress to evaluate the impacts of science and technology and help shape their potential on behalf of human welfare.

On March 7, 1967, Mr. Daddario, then chairman of the science subcommittee, introduced H.R. 6698 "to provide a method for identifying, assessing, publicizing, and dealing with the implications and effects of applied research and technology" by establishing a Technology Assessment Board. The bill was introduced primarily as a stimulant to discussion.

Summary of H.R. 6698

The salient elements of H.R. 6698 were as follows:

It created a five member Technology Assessment Board whose members would be appointed by the President, by and with the advice and consent of the Senate. It provided that (1) no member of the Board engage in any business, vocation, or employment other than serving on the Board; (2) each member be appointed for a 5-year term; and (3) the rate of compensation for each member was that prescribed for level IV of the executive schedule.

It gave the Board the duty of (1) identifying the potentials of applied research and technology and promoting ways and means to accomplish their transfer into practical use, and (2) identifying the undesirable byproducts of such research and technology, in advance, and informing the public of their potential in order to eliminate or minimize them.

It provided for a 12-member General Advisory Council to advise the Board, and provided that the Council members be appointed by the President.

Statement on Technology Assessment

On July 3, 1967, Mr. Daddario issued a special statement on technology assessment, the result of continuing study of the Subcommittee on Science, Research, and Development into the consequences of applied science and technology. This statement was the next step in the evolution of technology assessment. It suggested the need for measuring the capability of Congress to assess the results of deploying technical knowledge and techniques. One of its objectives was to initiate thinking on an early warning system. Another was to place this new concept in the context of growing legislative concern over the management of applied science. The statement suggested that by identifying the appropriate role of Congress in judging alternatives for human benefits, the stage thus might be set for action by Congress in the future.

Seminar on Technology Assessment

Later that year, a seminar on technology assessment brought together directors of projects and studies which were concerned with "science and society" or "technology and culture." The seminar participants were as follows:

September 21-22, 1967:

Christopher Wright, director, Institute for the Study of Science in Human Affairs, Columbia University, appearing for Dr. Daniel Bell, chairman, Commission on the Year 2000, American Academy of Arts and Sciences.

Dr. Howard R. Bowen, president, University of Iowa.

Dean Louis H. Mayo, director, program of policy studies in science and technology, The George Washington University.

Dr. Emmanuel G. Mesthene, executive director, program on technology and society, Harvard University.

Milton Leitenberg, scientific director, Committee for Environmental Information, St. Louis, Mo.

Dr. Dael Wolfe, publisher, Science, Washington, D.C.

Dr. Lynton K. Caldwell, professor of government, Indiana University.

Dr. A. Hunter Dupree, professor of history, University of California, Berkeley, Calif.

Prof. Melvin Kranzberg, department of humanities and social studies, program in science, technology, and public policy, Case Institute of Technology.

Prof. Eugene H. Skolnikoff, department of political science, Massachusetts Institute of Technology.

The participants concluded, among other things, that the legislative function was one important area where scientific information could be integrated with other demands of a highly technical society in coming to judgments on how and when to deploy technology.

A careful study and review of the seminar proceedings, however, convinced the subcommittee of the need for extensive further inquiries into various phases of technology assessment before legislation would be warranted.

91ST CONGRESS—H.R. 17046 AND H.R. 18469

Subsequently, the subcommittee arranged for three special studies involving distinct phases of technology assessment to be undertaken by separate organizations.

The first of these was the Legislative Reference Service which undertook to review the manner in which the Congress had been dealing with technological issues since World War II; this report was completed and submitted to the subcommittee in April 1969. It represented a major effort to delineate the kinds of scientific and technological problems which Congress is increasingly being called on to face. It further demonstrated that congressional techniques for assessing the impacts of technology upon society are seriously deficient.

The second study was undertaken by the National Academy of Sciences and was devoted to a review of the Nation's technology assessment capabilities and methods as they currently exist, and to suggested methods for improving Government action in this field; its report was submitted to the subcommittee in July 1969.

The third report was undertaken by the National Academy of Engineering and consisted of experimentation with three pilot studies in order to develop methodology for carrying out assessments; this report was submitted to the subcommittee in August 1969.

The Library study was done in the Science Policy Research Division. It represents a landmark reference work and has been revised and reissued in 1971. The study of the National Academy of Sciences was done by a special ad hoc task force of 18 members put together by Dr. Harvey Brooks of Harvard, chairman of the Academy's Committee on Science and Public Policy. The National Academy of Engineering study was done under the aegis of the Committee on Public Engineering Policy which was chaired by Dr. Chauncey Starr of UCLA; it was undertaken by three separate subtask force groups comprising approximately 50 persons.

The completion of the three studies and their careful review by the subcommittee and staff were deemed sufficient to permit moving onto the hearing stage.

1969 Hearings

Late in 1969, convinced that it now had sufficient background to consider an operating assessment organization for the Congress, the

subcommittee held hearings on the institutionalization of technology assessment.

The schedule of the hearings was as follows:

November 18, 1969:

Dr. W. D. McElroy, Director, National Science Foundation.

November 24, 1969:

Dr. L. Quincy Mumford, Librarian of Congress, accompanied by Dr. Charles S. Sheldon, Chief, Science Policy Research Division, and Dr. Franklin P. Huddle.

Dr. Lester S. Jayson, Director, Legislative Reference Service, Library of Congress.

Dr. Herbert L. Ley, Jr., Commissioner, Food and Drug Administration, accompanied by Dr. Dale Lindsay, Associate Commissioner, for Science, FDA, and Alvin Gottlieb, Assistant General Counsel for Food, Drugs and Environmental Health, HEW.

December 2, 1969:

Dr. Myron Tribus, Assistant Secretary of Commerce for Science and Technology.

Dr. Louis H. Mayo, director of the program of policy studies in science and technology at The George Washington University.

December 3, 1969:

Dr. Don. E. Kash, director, program in science and public policy, Department of Political Science, Purdue University.

Dr. Lawrence R. Hafstad, Committee on Public Engineering Policy, National Academy of Engineering.

December 4, 1969:

Elmer B. Staats, Comptroller General of the United States.

Dr. Milton Katz, director, international legal studies, Law School of Harvard University.

December 8, 1969:

Dr. Alvin M. Weinberg, Director, Oak Ridge National Laboratory.

Dr. Lewis M. Branscomb, Director, National Bureau of Standards.

Dr. John Pierce, executive director, Research-Communications Sciences Division, Bell Telephone Laboratories.

December 12, 1969:

Dr. Lee A. DuBridge, Director, Office of Science and Technology.

Dr. Emmanuel Mesthene, director, program of technology and society, Harvard University.

At the conclusion of the hearings, members of the subcommittee and staff reviewed the record and began formulating a draft bill to provide a mechanism within the legislative branch of the Government for dealing with technology assessment. The first draft was completed in January 1970 and was reviewed by a selected group of Government officials and private individuals. Upon receipt of their views, a second draft was made. It was introduced by Mr. Daddario and Mr. Mosher on April 16, 1970, as H.R. 17046.

Summary of H.R. 17046

A summary of this first 1970 bill follows:

The Technology Assessment Act set forth the rationale for the bill, describing the major contemporary issues as they relate to technology and enunciating the need of the Congress for new informational

mechanisms to help in the evaluation of the impact of current and future technology.

Established an Office of Technology Assessment within and responsible to the legislative branch of the Government. Provided that the office would consist of a technology assessment board to formulate policy and a Director to carry out such policies and administer operations of the Office. Provided that the duties of the Office would be as follows: (1) Identify existing or probable impacts of technology or technological programs; (2) where possible establish cause-and-effect relationships; (3) determine alternative technological methods of implementing specific programs; (4) determine alternative programs for achieving requisite goals; (5) make estimates and comparisons of the impacts of alternative methods and programs; (6) present findings of completed analyses to the appropriate legislative authorities; (7) identify areas where additional research or data collection are required to provide adequate support for the assessments and estimates mentioned; and (8) undertake such additional associated tasks as the appropriate authorities may direct.

Prescribed the nature of the Board which would be composed of 13 members as follows: two Senators, two Representatives, the Comptroller General, the Director of the Legislative Reference Service of the Library of Congress, and seven members from the public appointed by the President.

Established the directorship of the Office of Technology Assessment. Provided that the Director be appointed by the Board to serve a term of 6 years at a pay level equal to level 2 in the executive branch.

Enumerated the specific authority of the Office necessary to carry out the provisions of the act, including the promulgation of the rules and regulations, the use of contracts, hiring of personnel, and so forth.

Provided for special utilization of the Legislative Reference Service of the Library of Congress in gathering information and in maintaining monitoring systems to indicate important areas requiring technology assessment. Gave authority to the Librarian to set up such new divisions or units within LRS as might be necessary to help the Office of Technology Assessment in its functions.

Provided for specific coordination and liaison with the National Science Foundation, this being the chief executive agency which presently has active programs designed to do research into technology assessment techniques. Revised the National Science Foundation Act of 1950 to permit the Foundation to undertake special activities on behalf of the Office of Technology Assessment upon the request of its director.

Provided for an annual report to be submitted to the Congress.

Gave to the General Accounting Office the obligation and duties of providing financing and administrative services, plus other functions within its jurisdiction, to the Office of Technology Assessment. Stipulated that reimbursement should be made for these services to the General Accounting Office in accordance with such agreements as might be reached between the Comptroller General and the Technology Assessment Board.

Authorized \$5 million for the initial establishment of the Office of Technology Assessment for the fiscal year ending June 30, 1971, and thereafter such sums as may be necessary.

1970 hearings

The subcommittee held hearings on H.R. 17046, the Technology Assessment Act of 1970, in May and June. The schedule of the hearings was as follows:

May 20, 1970:

Representative Cornelius E. Gallagher of New Jersey.

Mr. Elmer B. Staats, Comptroller General of the United States.

May 21, 1970:

Dr. L. Quincy Mumford, Librarian of Congress.

Dr. Lester S. Jayson, Director, Legislative Reference Service, Library of Congress.

Dr. Harvey Brooks, dean of engineering and applied physics, Harvard University; chairman, Committee on Science and Public Policy, National Academy of Sciences.

May 26, 1970:

Dr. William D. McElroy, Director, National Science Foundation.

Dr. Edward Wenk, professor of engineering and public affairs, University of Washington.

May 27, 1970:

Dr. Eugene Lyons, chairman, department of government, Dartmouth College.

Dr. Dael Wolfe, executive officer, American Association for the Advancement of Science.

June 2, 1970:

Dr. W. E. Hanford, vice president for research, Olin Corporation.

Mr. Robert N. Faiman, chairman, Education Division, National Society of Professional Engineers.

June 3, 1970:

Dr. Jerome B. Wiesner, provost, Massachusetts Institute of Technology.

Gen. James M. Gavin, chairman of the board, Arthur D. Little, Inc.

By mid-June the subcommittee had drafted a new bill based on the hearings on H.R. 17046. It approved the new bill unanimously and on July 15, Mr. Daddario introduced it as H.R. 18469. This bill was cosponsored by the chairman of the full committee, George P. Miller; ranking minority member, James G. Fulton; and all subcommittee members.

The full committee ordered the bill reported on August 6, 1970: It was offered as an amending title to the Legislative Reorganization Act of 1970, September 16, 1970, but was ruled not germane on a point of order. No further House action was taken.

92D CONGRESS—H.R. 3269 AND H.R. 10243

A bill identical to H.R. 18469 was re-introduced in the new 92d Congress by Mr. Davis of Georgia, for himself and 24 other members of the House on February 2, 1971. Subsequently, in order to accommodate other members of the committee and of the House who wished to sponsor the legislation, a companion bill, H.R. 7728, was offered by Mr. Hanna for himself and nine other new members of the committee. This bill was introduced April 26, 1971.

On June 10 the Subcommittee on Science, Research, and Development, now under the chairmanship of Mr. Davis, met and reported

H.R. 3269 to the full committee without change. There was no dissenting vote in the subcommittee.

On July 22, 1971, the full committee met to receive the report of the subcommittee on H.R. 3269. It approved the bill with several minor amendments. It then ordered reported a clean bill containing the amendments, H.R. 10243.

SUMMARY OF TESTIMONY

1969 HEARINGS

The first series of hearings on technology assessment, following submission to the committee of contract studies on various aspects of this subject by the National Academy of Sciences, the National Academy of Engineering, and the Science Policy Research Division of the Library of Congress, was held between November 18 and December 12, 1969.

The scope of the hearings was limited to the technology assessment concept itself. Witnesses were drawn from a broad spectrum of our national society. These included representatives from the Government, from the academic community, from industry, and from the general public. They included not only physical scientists but social scientists and lay personnel. The hearings also incorporated a wide variety of inputs from persons who submitted statements in lieu of testimony on matters which essentially are correlated to technology assessment.

The full substance of the testimony held during this set of hearings need not be summarized here since it was not directed toward specific legislation. On the other hand, it is pertinent to note that a readily identifiable sequence of beliefs was common to all the testimony received during this broad-brush treatment of the technology assessment concept. Thus, while there might be a variety of opinions on the best manner of proceeding in the technology assessment area and on which aspects of the endeavor should be assigned what priority, there was virtually no dissent with regard to certain basic conclusions.

These, as developed in the course of the hearings, were as follows:

(1) The development of new technology, or more importantly its application, is proceeding at such a rate and is having—or could have—such widespread effect on contemporary society, both good and bad, as to require a far better assessment of its long-range impact than currently exists. Not only is more accurate information mandatory, but the speed of acquisition must be increased considerably. Otherwise, trends, customs, and habits may set in which are both irreversible and undesirable.

(2) For the reasons set forth in (1), the concept of technology assessment must be further developed and refined in both Government and non-Government circles.

(3) A strong capability in applying adequate techniques of technology assessment is necessary in both the executive and the legislative branches of the Federal Government. These twin capabilities should supplement each other and not be viewed or utilized as competing forces.

(4) In the exercise of any technology assessment activity, particular care must be taken to avoid the stifling of creativity and innovation with regard to the applications of new or developing technology. In

other words, pains must be taken to make sure that technology assessment does not become merely a form of technology arrestment.

(5) In order to help develop the capabilities discussed in the foregoing, it is essential that further pilot programs be undertaken to develop effective and continuing techniques of technology assessment and to identify those aspects of such techniques which appear to be common to all assessments.

(6) The need for governmental expertise in technology assessment is immediate and cannot wait on a leisurely evolution.

1970 HEARINGS

The 1970 hearings were held on a specific bill, H.R. 17046, during May and June.

While, as indicated earlier, all witnesses who appeared before the committee endorsed the concept of technology assessment and supported its objectives, there was some disagreement as to optimum procedures for carrying out these objectives.

The positive aspects of technology assessment were emphasized by Dr. Edward Wenk, Jr., professor of engineering and public affairs of the University of Washington, who stated that it was important to emphasize the role which technology assessment plays in insuring realization of the full benefits of the application of technology. He, as well as other witnesses, desired to establish the principle that technology assessment was not mainly a method for saying "No" to technological developments, but should also be expected to encourage those socially desirable technologies to their full realization.

Dr. Dael Wolfe, executive officer of the American Association for the Advancement of Science, as well as other witnesses, pointed out the danger of expecting too much too quickly from a congressional Office of Technology Assessment. Dr. Wolfe stated:

* * * it will have to take into account secondary and tertiary as well as primary effects. Practicality will require some narrowing of this huge task, but even so the job will be demanding and difficult, and history will later show some of the projections and forecasts to be in error. There is much still to be learned before secondary and tertiary effects can be anticipated with confidence, and at best we will not be able to expect high precision.

He also, however, succinctly stated what can be expected:

The purpose of the Office of Technology Assessment will be to increase the rationality of the debate over technological developments and proposals.

Reasons for Establishing an Office of Technology Assessment

Numerous witnesses pointed out that man has come to a watershed in his own history. Because of scientific knowledge and the resulting massive deployment of technologies, mankind can make this planet desolate for human habitation or, alternatively, reach new heights of civilization.

Since science and technology have such limitless potential for good or evil, the Congress needs a renewed ability to deal with the problems and opportunities facing it. As Dr. Jerome B. Wiesner, now President of the Massachusetts Institute of Technology stated:

Our task in dealing with these problems is twofold: To anticipate and avoid destructive applications of technology and to stimulate and emphasize those uses which would point us in the direction of a more humane, decent, happy society. We must learn to recognize and avoid those uses of technology which would be destructive or demeaning to people, no matter what their material yield: in other words, we must learn how to create a humane technology.

The Comptroller General of the United States, Mr. Elmer B. Staats, strongly endorsed the bill as a—

* * * mechanism which will give the Congress an effective means to secure competent unbiased information on the effects of technology and the utilization of such information as one element in the legislative assessment of matters pending before the Congress.

His point that the inputs from the Office of Technology Assessment would be one element in the broader legislative assessment by the Congress was echoed by other witnesses. It was clearly their understanding that the Office would make a contribution to the present legislative process, and not supplant it in any way. Because of the increasingly complex technological matters facing the Congress, however, the Office could play a vital role in the efficient and effective solution to the problems facing the Congress.

Gen. James M. Gavin, chairman of the board, Arthur D. Little, Inc., summed up the objectives for the Office of Technology Assessment as follows:

It would thus provide not only important factual data but—even more importantly, I believe—it would create an essential link between technology assessment and the body politic in this country. * * * it should not only provide information which Congress needs for legislative purposes, but it should be seen by each Member of Congress as a resource from which to obtain information that is to be disseminated to his constituency and to which feedback from that constituency should be directed.

Congressman Cornelius E. Gallagher, of New Jersey, capsulized his testimony by saying:

If civilized society, based upon the crown of political creation—the Constitution and the Bill of Rights—is to remain relevant in these revolutionary times, we must know what we are doing. In the area of the applications of science and technology, we do not know what we are doing now. The wise provisions of the Technology Assessment Act may give us the knowledge to work for the salvation of our democratic institutions and the preservation of the unique American experiment.

Dr. Harvey Brooks, dean of engineering and applied physics, Harvard University, recognized not only the necessity of the present legislation as a step toward better management of technology for the benefit of our society and the survival of civilization, but he also endorsed the proposed organization as being ideal for helping the Congress obtain

information for important decisions free of excessive influence by vested interests:

Today most of the competence for technological assessment lies either within the specialized executive agencies of Government, or with private organizations which can be funded for technology assessment activities only by agencies having a vested interest in a particular technology or in the regulation and control of a particular area of technological activity. Increasingly this situation is creating a credibility gap between the public and the Government * * *. The office proposed in this legislation should be as free of this sort of suspicion of ax grinding as it is possible to get. I think you will find that it will very quickly develop an enthusiastic and responsive constituency in a wide professional community outside the Government.

A number of witnesses discussed the relative roles which Congress and the President play in the decisionmaking process. It was pointed out that the evolution of presidential power, buttressed by the expertise of the various executive departments, has made it difficult for Congress to review the actions of the executive branch with sufficient knowledge and wisdom when they relate to complex technological issues. Dr. Eugene Lyons, chairman, department of history, Dartmouth College, summed up the role which the proposed Office of Technology Assessment could play in this balance by stating:

The fact that the bill is aimed at strengthening the role of the Congress in decisionmaking is, also, of primary importance.

Responsibilities and Authority of the Office of Technology Assessment

The responsibilities of the Office of Technology Assessment to provide information to the Congress concerning the widespread deployment of new technologies was carefully examined by a number of the witnesses. Some considered the "early warning system" to be even more important than in-depth assessments which would be made at the request of congressional committees. The wisdom of allowing the Director as well as the Board to initiate investigations was also viewed as desirable, since in some cases assessment might be needed even before specific legislative consideration of the issue occurred.

The question of the type and extent of authority needed by the Office of Technology Assessment to carry out its responsibilities was addressed by various witnesses. Mr. Staats stated that there should be certain technical changes in the language relating to the ability of the Office of Technology Assessment to enter into contracts and other arrangements. He also suggested that a new section be incorporated into the bill which would require contractors and parties to other arrangements to maintain adequate records in a manner prescribed by the Director of the Office of Technology Assessment and that the Comptroller General be authorized to inspect these records.

Dr. Brooks felt that the subpoena power given to the Office of Technology Assessment did not go far enough. He stated:

I believe the Office should have access even to proprietary and, in some instances, private information on a showing that

it is germane to its considerations, but with suitable protection of confidentiality. In other words, the court might refuse to grant public release of such data, but still require its disclosure to the Office under carefully specified limitations of access.

On the other hand, Dr. W. E. Hanford, vice president, research and development, of the Olin Corp., recommended:

I urge that this section be toned down. * * * compliance with the disclosures required under this bill is best accomplished on a voluntary basis. Compulsion is repugnant. There is no valid reason why a party whose assistance is being sought should be compelled to rely upon the granting of a petition of U.S. district court judge to retain the confidential nature of his asset.

Deputy Attorney General Richard G. Kleindienst, in a letter to the chairman of the subcommittee, made certain recommendations for striking a workable balance between the protection to the individual subpoenaed and the ability of the Office of Technology Assessment to obtain information. He also suggested that the Attorney General should represent the Office of Technology Assessment in litigation resulting from the enforcement of its subpoenas.

Technology Assessment Board

The responsibilities, composition, and size of the Technology Assessment Board were discussed by various witnesses. It was generally agreed that the Board should restrict itself to setting general policy directions and the electing of the Director, who would, in turn, carry out the day-to-day operations of the Office. A mix of legislative branch representatives and public members was generally considered desirable, and 13 Board members were considered adequate. Mr. Staats stated:

* * * the Director should be a voting member of the Board. It should be noted, however, that the addition of the Director as a voting member would result in a 14-member Board with the potential for tie votes. We therefore suggest that in the event it is decided to have the Director a voting member, the public members provided for * * * be reduced from seven to six.

In regard to the qualifications of the public members appointed to the Board, Mr. Staats suggested a small change:

We suggest that the term "public affairs" be changed to "public activities" because, in today's parlance, the term "public affairs" might be restrictively interpreted to mean persons engaged in public relations work.

Dr. Brooks viewed the possibility of the Board becoming self-perpetuating as undesirable. He stated:

I would prefer to see a Board with staggered 6-year terms somewhat after the manner of the National Science Board, and an upper limit of either 6 or 12 years on the length of service of any one member, with the exception of the Comptroller General and the Director of the Legislative Refer-

ence Service, who should serve ex officio. Although the provision for removal may be necessary, I would strongly hope that a tradition be established that removal would only be for cause, and not at the pleasure of the administration. I would urge in the strongest terms that the legislative history clearly establish this intent, an intent which would certainly be reinforced by a finite term of office.

Dr. Hanford, on the other hand, suggested that the Board should have a smaller membership, and participate more actively in the individual assessments being performed.

Director of the Office of Technology Assessment

Dr. Brooks, as well as Dr. Robert N. Faiman, chairman, Professional Engineers in Education, and member of the Executive Committee, National Society of Professional Engineers, suggested that the Director be appointed by the President from a slate of acceptable candidates nominated by the Board, rather than by direct election by the Board members.

There was a general consensus that the Director should be a voting member of the Board, as suggested at the beginning of the hearings by Mr. Staats.

Resources and Staff for the Office of Technology Assessment

The authorization set forth in the bill is for \$5 million for the first year of operation. Witnesses generally agreed that this was a reasonable figure for initiating such an office and would permit a number of in-depth assessments to be made.

Dr. Wolfe pointed out that—

* * * the staff of the proposed Office will owe primary loyalty to Congress and to the national welfare, not to the Navy, the Sierra Club, General Motors, the AFL-CIO, or any other special interest group.

He stated further that:

* * * I believe it will be possible to recruit well-qualified people to serve on the Office staff and to work on the assessments it decides to have conducted. There is now sufficiently widespread interest, particularly among young engineers, doctors, lawyers, and scientists, in work of high social importance to give promise that qualified staff members can be found.

The importance of a highly competent staff was emphasized by Dr. Hanford who stated that the success of the Office depended on "getting the top professionals to serve when they are needed."

The Director of the Office of Technology Assessment is designated as the equivalent to an executive level 2 appointment. The Deputy Director is designated as the equivalent to an executive level 3. These levels set an upper limit on salaries. Mr. Staats endorsed these salary levels and further suggested that all other staff members be limited to the maximum for a grade GS-18 of the civil service schedule. With regard to reimbursement of consultants, Mr. Staats suggested that the maximum rate also be equivalent to that of a GS-18.

General Accounting Office

Mr. Staats offered full support and cooperation to the proposed Office of Technology Assessment upon its establishment. In order specifically to indicate the authority of the General Accounting Office to perform investigative and other functions for the Office of Technology Assessment, Mr. Staats suggested that—

* * * to obviate any question of the authority of GAO to provide services to the Office in addition to the financial and administrative services provided for under section 10, we suggest that subsection 7(a) be revised to list the Comptroller General and the General Accounting Office along with the Librarian of Congress and the Legislative Reference Service.

Library of Congress

The Librarian of Congress, Dr. L. Quincy Mumford, has stated that "I strongly support this bill and I urge its enactment into law." Although offering to take greater responsibility for technology assessment than the bill provides, he stated that the Library was heartily in favor of the legislation as it stood, with certain technical amendments.

Dr. Lester S. Jayson, Director, Congressional Research Service, Library of Congress, estimated that the "early warning system" to be maintained by the Library under the terms of the bill might cost \$2 million a year to maintain and requested a specific authorization for this amount for the Library. He estimated that significant staff additions would be required, plus additional office and workspace.

Dr. Jayson pointed out very cogently that the effectiveness of the assessments performed depended heavily on the quality of translation of the technical and abstruse data and conclusions into common language, without losing its essential meaning. These concrete analyses make it possible for Members of Congress, who are of necessity, generalists, to understand and act upon complex technological questions.

National Science Foundation

It was generally accepted that the National Science Foundation could perform a useful role by supporting basic research related to technology assessment, including the development of methodologies and procedures to be used in the assessment process.

Dr. William D. McElroy, Director of the National Science Foundation, pointed out the desirability of coordinating technology assessment functions with the Foundation, but not explicitly tying the coordination to the Office of Interdisciplinary Research, which might be changed or abolished by later administrative action. His suggestion was endorsed by other witnesses.

Dr. McElroy also suggested that the proposed amendment to the National Science Foundation Act of 1950 be broadened to permit any agency of the Federal Government to support scientific activities through the National Science Foundation with funds transferred to the Foundation for that purpose. He also emphasized the desirability, from the standpoint of the Foundation, for the transfer of additional funds by the supporting agency to support the necessary staff administering these activities within the Foundation.

Reports of the Office of Technology Assessment

Section 9 of the bill calls for an annual report to be submitted to the Congress by the Office of Technology Assessment. It was pointed out

by several witnesses that this report, together with other reports and assessments issued by the Office, could play an important role in bringing the technological issues facing the Congress to the attention of the public. Dr. Lyons stated:

I place particular importance in the annual report that the OTA will be required to issue (though my comments relate to all the activities of the Office). For it is in this report, especially, that there will be full opportunity to deal with technology assessment issues beyond the limits of existing assessment agencies.

In order to give the annual report as wide a distribution as possible, and to insure its maximum impact on Government policies, the suggestion was made that it be explicitly submitted to the President as well as the Congress. The assumption by the witnesses was that it thus could be expected to receive close study by both the Office of Science and Technology and the Council on Environmental Quality within the executive branch.

COMMITTEE ACTION—1970

In the course of its deliberations on H.R. 17046, the committee made a number of changes in the bill. While some of these were substantive in nature, none of them altered the basic philosophy or approach of the bill as originally designed. The changes of significance between H.R. 17046 and its successor H.R. 18469 are described herewith.

Summary of H.R. 18469

Section 1 established title of the bill.

Section 2 set out the reasons for the legislation and described the need of Congress to equip itself with a new and better method of securing information of technological impacts on society.

Administration

Section 3 set up the Office of Technology Assessment as an independent arm of the Congress. The duties and functions of the Office were described.

Section 4 created a 13-member Technology Assessment Board which was charged with formulating policy for the operation of the Office.

Changes: The number of public members appointed by the President was reduced from seven to six. The Director of the Office was made a voting member of the Board except in cases of his own reappointment. The term of office of public members was set at 6 years, instead of for an indefinite period, with terms staggered so that two members went off every 2 years. Public members were limited to a maximum of 12 years.

Section 5 established the Office of Director of the Office of Technology Assessment and Deputy Director.

Authority of OTA

Section 6 described the general authority of the Office and provided it with routine legal power for conducting its business.

Changes: The subpoena power was enlarged to make germane documents available to the Office even though they involved proprietary

and private information upon a showing of adequate need, but under conditions which would prevent disclosure and which would guarantee the confidential nature of such documents. An additional section provided appropriate contempt proceedings through Federal courts in cases where there was failure to comply with the subpoenas. Language was included to assure adequate auditing procedures.

Supportive Services

Section 7 established liaison between OTA and the Legislative Reference Service of the Library of Congress and described the services to be provided by LRS as a supportive agency.

Changes: The section provided authority to OTA to reimburse the Library for services as agreed upon between the Librarian and the Board.

Section 8 coordinated the activities of the OTA with technology assessment functions of the National Science Foundation.

Changes: Reference to the Office of Interdisciplinary Research of the NSF was deleted as unnecessary. An existing clause in the NSF Act was amended to authorize OTA to work through NSF when necessary. It provided that NSF use transferred funds for this purpose when feasible rather than making such use mandatory.

Reports

Section 9 provided for an annual report from the Office.

Changes: This report would be submitted to the President as well as to the Congress.

Financial

Section 10 provided that the GAO provide the Office with appropriate investigative support on matters within its jurisdiction, plus financial and administrative services with reimbursement made according to agreements reached by the Board and the Comptroller General.

Section 11 authorized \$5 million to get OTA established and underway during fiscal 1971. Continuing authorization was provided thereafter.

COMMITTEE ACTION—1971

The committee did not hold further hearings in 1971 for several reasons. One of these centered about the mass of study, information and comprehensive hearings which had already been completed during the previous five years. It was concluded that further hearings would add little of substance to the record. Secondly, it was clear to the committee that there had been no change in conditions of need. If anything, it was felt that the need for an Office of Technology Assessment was now greater than ever.

In its deliberations on H.R. 3269, however, the committee adopted five amendments designed to streamline the Office. None of the amendments represented a substantive change in approach, method, or philosophy.

The amendments were as follows:

(1) Lower the number of members on the Technology Assessment Board from 13 to 11 by reducing the number of public members on the Board from 6 to 4. The term of the public members was reduced from 6 years to 4.

(2) Require the appointment of the Senate members of the Board to be made by the President pro tempore of the Senate rather than the President of the Senate;

(3) Give committee members other than the chairman of a congressional committee a voice in requesting assessments;

(4) Authorize the Comptroller General to provide substantive support to the Office of Technology Assessment as well as administrative support;

(5) Limit the authorization for the Office to Fiscal Year 1972—the future authorization to be determined by Congress at a later date.

SECTIONAL ANALYSIS OF H.R. 10243

Section 1

This section establishes the title as the "Technology Assessment Act of 1971."

Section 2

This section sets out the declaration of purpose as follows:

(a) Emergent national problems, physical, biological, and social, are of such a nature and are developing at such an unprecedented rate as to constitute a major threat to the security and general welfare of the United States.

(b) Such problems are largely the result of and are allied to—(1) the increasing pressures of population; (2) the rapid consumption of natural resources; and (3) the deterioration of the human environment, natural and social—though not necessarily limited to or by these factors.

(c) The growth in scale and extent of technological application is a crucial element in such problems and either is or can be a pivotal influence with respect both to their cause and to their solution.

(d) The present mechanisms of the Congress do not provide the legislative branch with adequate independent and timely information concerning the potential application or impact of such technology, particularly in those instances where the Federal Government may be called upon to consider support, management, or regulation of technological applications.

(e) It is therefore imperative that the Congress equip itself with new and effective means for securing competent, unbiased information concerning the effects, physical, economic, social, and political, of the applications of technology, and that such information be utilized whenever appropriate as one element in the legislative assessment of matters pending before the Congress.

Section 3

This section establishes an Office of Technology Assessment within the legislative branch of the Government. The Office would be independent of any other legislative arm and responsible only to the Congress. The Office would consist of a Technology Assessment Board, charged with the formulation of policy, and a Director, who would administer the operations of the Office.

The functions of the Office would be to provide early appraisal of the probable impacts, positive and negative, of the applications of technology—existing, new, and developing. The Office is charged with the following duties: (1) identify existing or probable impacts of technology

or technological programs; (2) where possible establish cause-and-effect relationships; (3) determine alternative technological methods of implementing specific programs; (4) determine alternative programs for achieving requisite goals; (5) make estimates and comparisons of the impacts of alternative methods and programs; (6) present findings of completed analyses to the appropriate legislative authorities; (7) identify areas where additional research or data collection is required to provide adequate support for the assessments and estimates described in Nos. (1) through (5); and (8) undertake such additional associated tasks as the appropriate authorities specified under subsection (d) may direct.

Assessments could be initiated by (1) the chairman of any congressional committee, acting for himself or the ranking minority member or a majority of the committee, (2) the Board, or (3) the Director. The results of all surveys, studies, reports, and findings would be freely available to the public except in cases where to do so would violate national security or where information is privileged under various Federal statutes.

The Office is charged to make use of private contractors and ad hoc groups in developing its assessments as well as utilize such Government facilities as may be feasible.

Section 4

The Board consists of 11 members as follows: (1) two Members of the Senate who shall not be members of the same political party, to be appointed by the President pro tempore of the Senate; (2) two Members of the House of Representatives who shall not be members of the same political party, to be appointed by the Speaker of the House of Representatives; (3) the Comptroller General of the United States; (4) the Director of the Congressional Research Service of the Library of Congress; (5) four members from the public, appointed by the President, by and with the advice and consent of the Senate, who shall be persons eminent in one or more fields of science or engineering or experienced in the administration of technological activities, or who may be judged qualified on the basis of contributions made to educational or public activities; (6) the Director of the Office of Technology Assessment, who is a voting member except in cases where his own appointment is involved.

The Board is charged with the election of its own Chairman and Vice Chairman from among its public members. Provision is made for a quorum to do business and for frequency of meetings. Term of office of public members is set at 4 years, with two memberships expiring every 2 years. Such members are eligible for reappointment once.

Usual provisions are made for travel expenses and per diem for Board members, who would otherwise serve without compensation if Government members or at a rate of \$100 per day if public members.

Section 5

This section provides that the Director be appointed by the Board for a term of 6 years and receive basic pay provided for level II of the executive schedule. A Deputy Director is appointed by the Director and he is authorized to receive basic pay at the rate provided for level III of the executive schedule. Both the Director and the Deputy Director would be full-time employees and prohibited from engaging in other business while serving in these capacities.

Section 6

This section sets out the authority of the Office to prescribe its rules and regulations, make expenditures, enter into contracts, make advance payments, acquire property, accept voluntary services, etc. The section provides that the Director shall prescribe, appoint, and fix the compensation of personnel in the Office in accordance with the provisions of civil service regulations, with certain exceptions.

The Office is prohibited from itself operating any laboratory, pilot plant, or test facilities in the pursuit of its mission.

The Office is given authority to take testimony, acquire information, and sit and act at such times and places as it may deem necessary. The power of subpoena is provided to the Office or its duly constituted officials. However, special provisions are incorporated to protect proprietary information when subpoena is issued and to guarantee against invasions of privacy. Where such action is necessary, individuals involved are authorized to petition the U.S. district court for the necessary excision of documents or information provided from public disclosure. In cases of failure to obey a subpoena, provision is made for contempt proceedings through the Department of Justice.

Provision is made for the acquisition of information from other Government agencies; also those operating under contract with the Office are required to maintain appropriate records and be subject to audit by the Office of the Comptroller General.

Section 7

This section provides that the Library of Congress be utilized by the Office for supportive services. The assistance to be provided by the Congressional Research Service therein is described as follows: (1) Maintaining a monitoring indicator system with respect to the natural and social environments which might reveal early impacts of technological change, but any such system shall be coordinated with other assessment activities which may exist in the departments and agencies of the executive branch of the Government; (2) making surveys of on-going and proposed programs of Government with a high or novel technology content, together with timetables of applied science showing promising developments; (3) publishing, from time to time, anticipatory reports and forecasts; (4) recording the activities and responsibilities of Federal agencies in affecting or being affected by technological change; (5) when warranted, recommending full-scale assessments; (6) preparing background reports to aid in receiving and using the assessments; (7) providing staff assistance in preparing for or holding committee hearings to consider the findings of the assessments; (8) reviewing the findings of any assessment made by or for the Office; and (9) assisting the Office in the maintenance of liaison with existing agencies involved in technology assessments.

Provision is made for reimbursement to the Library for activities carried on in behalf of the Office. The Librarian is also authorized to establish within the Service such additional organization as may be necessary to carry out the purposes of the act.

Section 8

This section provides for continuing liaison with the National Science Foundation, whose ongoing program in Research Applied to

National Needs is partially devoted to the development of technology assessment techniques. The organic act of the National Science Foundation is also amended to permit the Foundation to undertake the support of research requested by the Office in appropriate circumstances.

Section 9

This section provides for an annual report to be submitted to the Congress and the President. Such report would evaluate the existing state of the art with regard to technology assessment techniques and forecast, so far as feasible, technological areas requiring future attention.

Section 10

This section provides that the General Accounting Office should make available all pertinent services plus financial and administrative support to the Office of Technology Assessment. Authority is given for such reimbursement to the General Accounting Office by the OTA as may be appropriate.

Section 11

This section authorizes \$5 million to be appropriated to the Office for fiscal year 1972. It also authorizes continued availability of such authorization, subject to such periods as may be specified in appropriation acts.

COST AND BUDGET DATA

The bill will authorize appropriations for fiscal year 1972 in the amount of \$5 million.

COMMITTEE RECOMMENDATIONS

A quorum being present, the bill was favorably reported.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

SECTION 3 OF THE NATIONAL SCIENCE FOUNDATION ACT OF 1950

FUNCTIONS OF THE FOUNDATION

SEC. 3. (a) * * *

(b) The Foundation is authorized to initiate and support specific scientific activities in connection with matters relating to international [cooperation or national security] *cooperation, national security, and the effects of scientific applications upon society* by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such [scientific] activities. [Such activities when] *When* initiated or supported pursuant to requests

made by [the Secretary of State or the Secretary of Defense] *any other Federal department or agency, including the Office of Technology Assessment, such activities* shall be financed [solely] *whenever feasible* from funds transferred to the Foundation by the requesting [Secretary] *official* as provided in section 14(g), and any such activities shall be unclassified and shall be identified by the Foundation as being undertaken at the request of the appropriate [Secretary] *official*.

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